

Understanding Wisconsin's Hazardous Air Pollutant Rules & Regulations

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BACKGROUND

Wisconsin's hazardous air pollutant rules were the result of extensive public involvement, starting in the early 1980s. At that time there was interest in establishing hazardous air pollutant limits for two chemicals: 1,1,1-Trichloroethane (also known as methyl chloroform) and methylene chloride (also known as dichloromethane). During this period of time, there was concern in Wisconsin about the health effects of toxic air releases and a concern about the lack of policy and regulations of hazardous air pollutants at the federal level.

As a result of this concern, a 7-member group of scientists, industry, and governmental representatives called the Hazardous Emissions Task Force was formed in May 1983 and the group was given the following tasks:

- Recommend a definition for a toxic and/or hazardous air emission
- Recommend a methodology (standard setting process) to be established in rulemaking for establishing emission limits to adequately protect public health and welfare
- Examine potential health impacts surrounding the use of 1,1,1-trichloroethane and methylene chloride and make recommendations as to the adequacy of existing regulations applied to these compounds.
- Recommend which sources of hazardous emissions should be exempt from permit requirements because the potential emissions would not pose a significant threat to public health, safety or welfare.

The Hazardous Emissions Task Force, on a vote of 5 to 2, made its report of recommendations in July of 1985. The report stated that the authors did not presuppose the existence or absence of a hazardous air contaminant problem in Wisconsin, but made their recommendations "with an eye toward prevention of such problems". WDNR staff then began development of Wisconsin's hazardous air pollutant rules and requirements. Staff held numerous public informational meetings and public hearings on a rule that incorporated the findings of the task force. After much debate and controversy, the hazardous air pollutant requirements, Ch. NR 445, Wis. Adm. Code, became effective in October 1988.

The hazardous air pollutant requirements have been controversial since their adoption. For example, not long after the NR 445 was adopted, it was challenged by a group of 23 manufacturers, industry trade groups, the Wisconsin Hospital Association and Shawano Community Hospital. In May of 1990, the State Appeals Court upheld the WDNR's authority to establish emissions limitations on Wisconsin sources.

Also in 1990, a required report to consider appropriate emissions limitations on chemicals in Table 4 of the NR 445 met with considerable controversy with the proposal to introduce chronic non-cancer toxicity based limits, called reference concentrations, into the rule. As a result of the controversy, the DNR board delayed action on the incorporation of reference concentrations into the rule in September of 1991. The Board then directed Department staff to work with affected industry on a proposal that incorporated reference concentrations but also addressed industry concerns about using the reference concentrations for establishing regulatory limits. After numerous meetings and public hearings in the spring of 1994, the Natural Resources Board

adopted a revised rule incorporating reference concentrations in August 1994. The use of reference concentrations in the rule became effective in January 1995.

INTRODUCTION

Generally speaking, toxicology (the science of poisons) divides chemicals into two groups – carcinogens and non-carcinogens.

CARCINOGENS (These chemicals are listed in Tables 3A and 3B in Ch. NR 445)

Carcinogens are categorized by the strength of evidence that they may pose a hazard. When there is sufficient evidence the chemical can cause cancer in humans, the chemical is called a known human carcinogen. In the Wisconsin hazardous air pollutant rule, these chemicals are placed in what is known as Table 3A of the rule. Sources which emit these chemicals above a threshold amount called a de minimis, may be required to install control equipment to control these emissions. The control technology approach used here is called the Lowest Achievable Emission Rate (LAER). (For a more detailed definition, see the definition of “lowest achievable emission rate” in NR 445.02 (8)). There is a variance procedure in the rules however. If a source can demonstrate to the department that it is economically infeasible, that health is protected and the source meets a level of control called Best Available Control Technology (BACT), the source is then relieved from the requirement for meeting LAER emission levels.

When there is evidence in animals, but insufficient evidence the chemical can cause cancer in humans, the chemical is called a suspected carcinogen. In the Wisconsin hazardous air pollutant rule, these chemicals are placed in what is known as Table 3B of the rule. Sources which emit these chemical above a threshold amount (the de minimis) are required to install the Best Available Control Technology (BACT). BACT is the maximum degree of reduction practically achievable, taking into account energy, economic and environmental impacts and other costs related to the source.

It is important to note de minimis values for carcinogens were established as a result of compromise and the limited information that was available at the time (1987-1988). As a result, de minimis values are in some cases established that reflect a risk range of one in one million (10^{-6}), but in other cases represent much higher risks. In other cases, a default de minimis level was chosen of 25 pounds per year for known carcinogens (Table 3A) and 250 pounds per year for suspected carcinogens (Table 3B).

NON-CARCINOGENS (These chemicals are listed in Tables 1, 2, 4, and 5 in Ch. NR 445)

Tables 1, 2 and 4: Acute Exposure Concerns (1 and 24 hour limits): Non-carcinogens are chemicals that cause any toxic effect other than cancer. Examples of non-cancer effects include respiratory irritation, asthma, neurological toxicity, reproductive toxicity, cardiac toxicity, and birth defects (teratogenicity).

Wisconsin uses the American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) to establish ambient air concentrations.

The TLV is defined as: **“airborne concentrations of substances...under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse health effects”**.

Since these occupational health values are derived for protecting healthy workers, the rule adds safety factors to allow for the fact that people in the public are exposed for a longer period of time and they may be more sensitive than healthy workers.

For TLVs that are protective over an 8 hour work day, the rule sets a limit of 2.4% (this is the same as the TLV divided by a factor of 42: 10 for protection of sensitive individuals and 4.2 to account for different exposure times for public exposure versus occupational exposure (168 (7 days times 24 hours) divided by 40 hours exposure for occupational exposures). For TLVs that have a shorter 15-minute limit, the rule sets a limit of 10% of the TLV over a one hour averaging time (only the factor of 10 for sensitive individuals is used).

The TLV based limits apply to Tables 1, 2 and 4 of the rules. Table 1 and 4 requirements apply to all non-exempt emission sources, however the Table 4 chemicals were originally placed in this separate table to allow for the rule to be phased in. Since the only difference between Table 1 and 4 is the compliance dates and those dates have now passed, the Department has proposed to add the Table 4 chemicals to Table 1. The Table 2 chemicals are pesticides. Only a source that manufactures or processes these chemicals is regulated under this portion of the rule.

Table 5: Reference Concentrations (RfCs) - Long Term (Chronic) Exposures (Annual limits): In addition to the TLVs, Wisconsin also has adopted the use of USEPA reference concentrations (RfCs) to account for the non-carcinogenic effects of chronic exposures.

The reference concentration (RfC) is defined as: **“an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily inhalation exposure of the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime”**.

The reference concentration based limits are found in Table 5 of the rule. There is a variance provision in the rule that requires a source to demonstrate that the residual emissions would not cause significant environmental or public health risks, the emissions are controlled to a level which is the best achievable control technology, and meeting the reference concentration would be economically infeasible.

What Must A Source Do To Comply with Hazardous Air Pollutant Rules & Requirements Found in Chapters NR 406, 407, 410, 438 and 445?

The requirements imposed on stationary sources capable of emitting hazardous air pollutants (HAPs) listed in Chapter NR 445 are found in five chapters in the Air Pollution Regulations, Chapters 406 (Construction Permits), 407 (Operation Permits), 410 (Fees), 438 (Emission Inventory) and 445 (Limitations) of the Wisconsin Administrative Code. However, just knowing where to find them does not provide you with enough information to have a clear understanding of when and how to apply them.

The following information is intended to provide a general understanding of the regulatory process as it relates to HAPs in Wisconsin. Attached are excerpts from State Statutes providing the underlying authority for the HAP program, key definitions and explanations. The narrative steps the reader through the process, explaining the different program elements and illustrating how the various tables and their inter-relationships work. Please note that the federal hazardous air pollutant rules promulgated under NR 460 and CFR parts 61 and 63 are not part of this discussion.

Identify

The first step in both understanding and meeting the requirements of the hazardous air pollutant rules is to accurately determine what HAPs a source is capable of emitting. Given the number of HAPs listed in chs. NR 445 and 438, this task can appear daunting. However, by using a systematic approach and tapping into numerous information sources available, the task becomes less formidable.

There are a number of ways that this may be accomplished. Product specifications or material safety data sheets are a good place to start. Hazardous substances may make up the majority of a raw material or might be identified as a trace contaminant in the material. Publications by industry groups or government agencies may indicate the presence of hazardous materials or that they are formed as a by-product of a manufacturing or combustion process. Universities or research centers specializing in an industry may also be able to provide assistance in identification. Information available from similar industries may provide results of their investigation or insight as to what HAPs others have found.

An owner or operator of a facility *is not* expected to demonstrate that their source cannot emit any or all of the HAPs listed in the chapter. However a facility is expected to conduct a thorough examination of raw materials and waste streams in order to identify which HAPs are emitted.

Quantify

The second step is to estimate the amount of each HAP a facility actually emits, as well as how much it potentially can and would be allowed to emit. It is important to quantify emissions in these various ways because air program requirements look at different emission characterizations for different purposes. Proper records documenting the quantification effort should be kept on file at the facility even if it shows the facility does not fall under more prescriptive regulatory requirements.

Precise analytical measurement is not necessarily required for the regulatory process, although it may be desirable in some cases. The precision of emission estimates can vary depending on how they are to be used. In most cases, estimates can be made in an iterative fashion starting with conservative assumptions and proceeding to more detailed analysis only if needed. Some examples of how estimates can be made:

Engineering calculations based on process specific information and:

- emission factors found in various industry and government literature,
- emission factors based on emission tests performed on similar sources,
- material safety data sheets,
- product formulations,
- product specifications, and
- material balances.

Measurements of HAPs in raw materials or exhaust streams should be made in situations when a greater degree of precision is needed to ascertain applicable regulatory requirements or to demonstrate compliance. In these cases, discussions with the air program are recommended (and possibly required) to ensure that test methods and conditions used will result in information that will be acceptable for its intended purpose.

Once a facility knows which HAPs it can and does emit it can use this information to determine which air program regulations would apply to it.

Comply

There are 3 major Air Management program areas a facility needs to consider once they determine they have the potential to emit a HAP listed in ch. NR 445. Depending on the type of source, pollutant and amount, a comparison with regulatory threshold amounts in the program areas of Construction and Operation Permits, Emission Inventory Reporting and Control of Hazardous Air Pollutants is needed to determine which regulations apply.

➤ Construction and Operation Permits

Facilities theoretically able to emit HAPs over a threshold amount¹, and which are not covered by listed exemptions, must obtain a permit to operate.

¹ The term "threshold amount" in this section refers to various emission rates listed in the various tables and narrative in chs. NR 406, 407, 438 and 445, Wis. Adm. Code.

New and/or modified sources must obtain the permit before construction, existing sources are evaluated according to a published schedule. The requirements for new and/or modified sources are found in NR 406, while the requirements for existing sources are found in NR 407.

➤ **Emission Inventory Reporting**

Facilities actually emitting above a threshold amount must report and possibly pay fees. A report must be filed for any year that emissions exceed the threshold level.

Fees are assessed for facilities requiring an operation permit actually emitting above threshold levels at a rate established in the State Statutes (s.285.69, Stats.). The reporting threshold and requirements for all sources are found in NR 438. Fee requirements are found in NR 410².

➤ **Control of Hazardous Air Pollutants**

Facilities allowed to emit above a threshold amount must either demonstrate that emissions do not exceed standards that are expressed as ambient air concentrations or utilize appropriate technologies to control emissions. The requirements for all sources are found in NR 445. Typically, a source needing to meet standards is also required to obtain a permit.

The regulations in NR 445 require the reader pay close attention to detail. Understanding the organization and the intent behind the various requirements will better enable the user of the regulation to apply it correctly.

A closer look at the actual regulations and further explanation follows.

A Closer Look

Why are the HAPs organized the way they are in the air toxic requirements?

First you need to look at ch. **NR 445**.

To begin with, the HAPs themselves are divided into 2 groups of contaminants in NR 445. These groups are contaminants **with** (*non-carcinogens*), and **without** (*carcinogens*) **acceptable ambient concentrations**. These major groupings were designed to reflect the air program's approach to controlling HAPs. These 2 groups are then further divided and placed in multiple tables based on the specific health effect endpoint being protected and their applicable compliance requirements.

² People sometimes get confused with reporting HAP emissions for NR 438 and the Toxic Release Inventory (TRI) reporting requirements. The air regulations as discussed in this primer are state regulations while TRI are federal regulations. TRI allows people to report using a range of values for a HAP and have different HAP requirements. Consequently, TRI HAP information may be slightly different than the information reported to fulfill state requirements.

HAPs with acceptable ambient concentrations are divided into those that can cause *acute* (Tables 1, 2 and 4) and those that can cause *chronic* (Table 5) health effects. The control approach for these types of HAPs is to limit emissions such that specified ambient air concentration levels will not be exceeded over specified time frames.

HAPs without acceptable ambient concentrations are categorized as those *known* (Table 3A) and those *suspected* (Table 3B) to cause cancer. The control approach for these types of HAPs is to reduce emissions to their lowest possible level.

Compliance demonstration and deadlines vary for new and modified sources vs. existing sources and for each of the tables. Generally, compliance with the emission limitations in NR 445 apply to new and modified sources at startup, while existing sources meet an established schedule.

Figures 1, 2 and 3 illustrate basic table setup and point out key elements of the requirements.

Chapters **NR 406 and 407**, however, use the threshold levels in NR 445 in two different ways. In these chapters the NR 445 levels are used to establish exemption levels for permitting emission sources. A source is exempt from the permit requirements if it theoretically does not have the ability to exceed the HAP threshold levels in NR 445 and does not need a permit for any other reason.

Under NR 406, if the source needs a construction permit, all HAP information for the source must be included in the permit application.

In NR 407, a fraction of the threshold levels in NR 445 is used to determine whether or not information related to a particular emissions unit is required to be included in the operation permit application. These numbers are listed in Table 2 of ch. NR 407 and are generally referred to as inclusion levels. The inclusion level is capped at the lesser of 10% of the NR 445 threshold levels projected over 24 hours/ day and 365 days/year or 2000 pounds/year.

This approach was designed to reflect the Air Program's intention to evaluate and require permits for significant sources of HAP emissions.

See Figure 4 for additional information on the requirements of NR 407.

While ch. **NR 438** takes what appears to be a much simpler approach to listing HAPs, it also is closely tied into the threshold levels in NR 445. The requirements of NR 438 state that if a source actually emits more of a HAP than the reporting level listed in Table 1 of that chapter, it must report how much of that HAP is emitted. The reporting level is generally set at the lesser of 50% of the NR 445 threshold levels projected over 24 hours/ day and 365 days/year or 6000 pounds/year.

This approach was designed to reflect the Air Program's intention to gather emission information from sources of HAP emissions.

Chapter **NR 410** states that if you report a HAP at or more than 5 tons of a billable pollutant per year under the requirements of NR 438 and you are required to have an operation permit, you must pay an annual fee at a rate established by state statute. Billable emissions include particulate matter, volatile organic compounds and all gases. Any pollutant that can be classified as a hazardous air pollutant and either a volatile organic compound or particulate matter is only billed as part of the volatile organic compound or particulate matter total. Fees apply to approximately 60 billable pollutants out of the 576 pollutants listed in NR 438.

Figures 5, 6 and 7 point out these requirements and illustrate the table relationships.

Why aren't the HAP emission standards for non-carcinogenic substances in NR 445 based on actual emissions?

The emission standards established in NR 445 were the outcome of a public participation process that took place over 5 years and are based on recommendations made by the Hazardous Emissions Task Force in July 1985 *. To quote from the report *"Lastly, in making these recommendations, the Hazardous Emissions Task Force has not presupposed the existence or absence of a hazardous air contaminant problem in Wisconsin. Rather, these recommendations are made with an eye toward the prevention of such problems."* In light of these recommendations, this part of the hazardous air pollutant program was designed around ensuring the public's potential, rather than actual, exposure to HAPs would be limited.

Why are the compliance schedules for HAP emission standards so complicated?

Compliance schedules for existing sources in ch. NR 445 were designed to accomplish and accommodate a number of things.

First, the general approach was to establish schedules that had the largest *potential* emitters of HAPs report their emissions and compliance demonstrations to the department first. Facilities were subject to these schedules based on their actual and allowable emissions of particulate matter or volatile organic compounds. It was necessary to use this approach at the time because source specific HAP emissions inventories had not yet been developed.

Next, a delayed schedule for reporting and complying with emission standards for HAPs listed in Table 4 was established to allow time for the department to assess the need for standards different from those originally placed in the rule.

Finally, delayed compliance schedules for wastewater treatment plants and sources of chloroform and formaldehyde were also established to allow time for the department to evaluate concerns related to identifying, estimating and controlling emissions from these sources.

Developments rising out of rule revisions based on recommendations made in the study of Table 4 HAPs in 1991 and the creation of a new federal air toxic program complicated matters further. Additional schedules were placed in NR 445 to allow existing sources time to comply with new

* Report of Recommendations of the Hazardous Emissions Task Force to the Wisconsin Department of Natural Resources, July 1985.

state requirements without putting them at a disadvantage with respect to the requirements of the federal program.

Relevant State Statute Authority & Requirements and Key Definitions

285.27(2)(a), Stats.

(a) *Similar to federal standard.* If an emission standard for a hazardous air contaminant is promulgated under section 112 of the federal clean air act, the department shall promulgate by rule a similar standard but this standard may not be more restrictive in terms of emission limitations than the federal standard except as provided under sub. (4).

285.27(2)(b), Stats.

(b) *Standard to protect public health or welfare.* If an emission standard for a hazardous air contaminant is not promulgated under section 112 of the federal clean air act, the department may promulgate an emission standard for the hazardous air contaminant if the department finds the standard is needed to provide adequate protection for public health or welfare.

285.69(2)(a)1., Stats.

(2) *Fees for persons required to have operation permits.*

(a) The department shall promulgate rules for the payment and collection of fees by the owner or operator of a stationary source for which an operation permit is required.

The rules shall provide all of the following:

1. That fees collected in a year are based on actual emissions of all regulated pollutants and any other air contaminant specified by the department in the rules in the preceding year.

Key Definitions

285.01, Stats.

"Air contaminant source", or "source" if not otherwise modified, means any facility, building, structure, installation, equipment, vehicle or action that emits or may emit an air contaminant directly, indirectly or in combination with another facility, building, structure, installation, equipment, vehicle or action. **(Relevant to NR 406, 407, 410, 438 and 445)**

"Allowable emission" means the emission rate calculated using the maximum rated capacity of the origin of, or the equipment emitting an air contaminant based on the most stringent applicable emission limitation and accounting for any enforceable permit conditions which limit operating rate, or hours of operation, or both. **(Relevant to NR 406, 407 and 445)**

"Ambient air quality standard" means a level of air quality which will protect public health with an adequate margin of safety or may be necessary to protect public welfare from anticipated adverse effects. **(Relevant to NR 406, 407 and 445)**

NR 400.02, Wis. Adm. Code

"Actual emissions" means the total emissions generated by a facility over a specified period of time taking into account any reductions made by a control device or technique.

(Relevant to NR 407, 410, 438 and 445)

"Ambient air" means the portion of the atmosphere external to buildings and to which the general public has access. **(Relevant to NR 445)**

"Potential to emit" means the maximum capacity of a stationary source to emit any air contaminant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air contaminant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation is enforceable by the administrator. **(Relevant to NR 406, 407, 410 and 445)**

"Maximum theoretical emissions" means the quantity of air contaminants that theoretically could be emitted by a stationary source without control devices based on the design capacity or maximum production capacity of the source. When determining annual maximum theoretical emissions, a source shall be presumed to operate 8,760 hours per year unless its physical design precludes 8,760 hours of operation per year. Where a source's physical design restricts the number of hours it may operate, annual maximum theoretical emissions shall be calculated taking this restriction into account. In determining the maximum theoretical emissions of VOCs for a source, the design capacity or maximum production capacity shall include the use of raw materials, coatings and inks with the highest VOC content used in practice by the source. Realistic operating conditions shall be taken into account in determining emissions under this subsection. **(Relevant to NR 406 and 407)**

Figure 1

Chapter NR 445 Table 1
Hazardous Air Contaminants With Acceptable Ambient Concentrations

| Contaminant | CAS Number | Emission Rate in Pounds/Hour* w/emission points | |
|-------------------|------------|---|-------------|
| | | < 25 ft. | ≥ 25 ft. |
| ACIDS | | | |
| Acetic acid | 64-19-7 | 2.083200 | 8.760000 |
| Hydrogen chloride | 7647-01-0 | 0.355200(c) | 1.368000(c) |
| Hydrogen fluoride | 7664-39-3 | 0.127200(c) | 0.480000(c) |
| Nitric acid | 7697-37-2 | 0.417600 | 1.752000 |
| Phosphoric acid | 7664-38-2 | 0.084000 | 0.336000 |
| Sulfuric acid | 7664-93-9 | 0.084000 | 0.336000 |

* The notation (c) indicates those contaminants with ceiling limits which are emission rates averaged over a one-hour period. Those contaminants without such a notation are emission rates per hour averaged over a 24 hour period.

NR 445.04 EMISSION LIMITS FOR NEW OR MODIFIED SOURCES. (1) TABLE 1 SUBSTANCES. Except as provided in par. (c) or s. NR 406.07(2), no owner or operator of a stationary source on which construction or modification commenced after October 1, 1988 may cause, allow or permit emissions from a source of a hazardous air contaminant listed in Table 1 in such quantity or duration as to cause ambient air concentrations off the source's property which exceed the limits in par. (a) or (b).

NR 445.05 EMISSION LIMITS FOR EXISTING SOURCES. (1) TABLE 1 SUBSTANCES. Except as provided in par. (c), no owner or operator of a stationary source on which construction or modification last commenced on or before October 1, 1988 may cause, allow or permit emissions from the source of a hazardous air contaminant listed in Table 1 of s. NR 445.04 in such quantity or duration as to cause ambient air concentrations off the source's property which exceed the limits in par. (a) or (b).

(a) 24-hour. 1. Two and four-tenths percent of the threshold limit value - time weighted average established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in s. NR 484.11, for any consecutive 24-hour averaging period; or

2. Ten percent of the threshold limit value - time weighted average established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in s. NR 484.11, for any 24-hour averaging period if the hazardous air contaminant is emitted no more than 5 days in any consecutive 30-day period and if the department determines after complying with s. NR 445.06(1) that such limits will not pose a threat to public health or welfare.

(b) One-hour. Ten percent of the threshold limit value - ceiling established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in s. NR 484.11, for any one-hour averaging period.

1.

A source with the ability to emit a HAP in an amount greater than the table value must submit a demonstration they will not exceed the applicable off property concentration for that HAP.

Figure 2

NR 445 Table 3
Hazardous Air Contaminants Without Acceptable Ambient Concentrations
Requiring Application of

A. Lowest Achievable Emission Rate for Sources of Group A Hazardous Air Contaminants,
B. Best Available Control Technology for Sources of
Group B Hazardous Air Contaminants¹

| Contaminant | CAS Number | lbs/year ² |
|---|------------|-----------------------|
| GROUP A CONTAMINANTS | | |
| 4-Aminobiphenyl | 92-67-1 | 25.0 |
| Arsenic and inorganic compounds, as As | 7440-38-2 | 25.0 |
| Asbestos | 1332-21-4 | 25.0 |
| Benzene | 71-43-2 | 300.0 |
| Benzidine | 92-87-5 | 2.0 |
| Bis(chloromethyl) ether(BCME) and technical grade | 542-88-1 | 0.10 |
| tert-Butyl chromate, as Cr | 1189-85-1 | 0.10 |
| Chloromethyl methyl ether(CMME) | 107-30-2 | 0.10 |
| Chromium (VI), water insoluble compounds, as Cr | 7440-47-3 | 2.0 |
| Chromyl chloride, as Cr | 14977-61-8 | 0.10 |
| Coke oven emissions | | 25.0 |
| 2-Naphthylamine | 91-59-8 | 25.0 |
| Nickel subsulfide | 12035-72-2 | 25.0 |
| Vinyl chloride | 75-01-4 | 300.0 |
| Pharmaceuticals (a total of all listed compounds) | | 25.0 |
| Azathioprine | 446-86-6 | |
| N,N-Bis(2-chloroethyl)-2-naphthylamine (Chloronaphazine) | 494-03-1 | |
| 1,4-Butanediol dimethanesulphonate (Myleran) | 55-98-1 | |
| Chlorambucil | 305-03-3 | |
| Cyclophosphamide | 50-18-0 | |
| Diethylstilbestrol (DES) | 56-53-1 | |
| Melphalan | 148-82-3 | |
| Mustard gas | 505-60-2 | |

NR 445.05(3) TABLE 3 SUBSTANCES. (a) *Group A.* Except as provided in par. (c), the owner or operator of any facility on which construction or modification last commenced on or before October 1, 1988 and which emits any hazardous air contaminant listed in group A of Table 3 of s. NR 445.04 in amounts greater than those listed in group A of this table shall control emissions of those hazardous air contaminants to a level which is the lowest achievable emission rate. The lowest achievable emission rate shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the lowest achievable emission rate to this emissions unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group A of Table 3 for the hazardous air contaminant, then the lowest achievable emission rate shall be met by other emissions units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group A of Table 3 or until all emissions units at the facility which emit at least 10% of the rate listed in group A of Table 3 for the hazardous air contaminant have met the lowest achievable emissions rate. If application of lowest achievable emissions rate to these emissions units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of lowest achievable emission rate on a reasonable array of smaller emissions units which emit the hazardous air contaminant.

Emission limits for Table 3 HAPs are based on actual emissions.

2.

Methodology presented in rule indicates which source(s) is subject to the control technology requirement and to what level emissions must be reduced.

Figure 3

Table 5
Hazardous Air Contaminants With Acceptable Ambient
Concentrations Based on the U.S. Environmental Protection Agency's
Reference Concentration Methodology

| Contaminant | CAS Number | Emission Rate in <u>lbs/yr.</u> with emission points | | Reference Concentration (micrograms per cubic meter) | Total Uncertainty Factor | Date of last revision to Wis. Adm. Code |
|---------------------------|------------|---|-------------------|---|--------------------------------|---|
| | | <25 ft. | >25 ft. | | | |
| Ammonia | 7664-41-7 | 21,039 | 91,264 | 100 | 30 | January 1, 1995 |
| Bromomethane | 74-83-9 | 631,174 | 2,737,907 | 3000 | 100 | January 1, 1995 |
| 1,2-Dichloropropane (PDC) | 78-87-5 | 842 | 3651 | 4 | 300 | January 1, 1995 |
| 1,3-Dichloropropene | 542-75-6 | 4208 | 18,253 | 20 | 30 | January 1, 1995 |
| Diesel engine emissions | | 1052 ¹ | 4563 ¹ | 5 | 30 | January 1, 1995 |
| N,N-Dimethylformamide | 68-12-2 | 6312 | 27,380 | 30 | 300 | January 1, 1995 |

NR 445.05(4r) TABLE 5 SUBSTANCES. (a) Annual limitations. Except as provided in par. (b), no owner or operator of a stationary source on which construction or modification last commenced on or before January 1, 1995, may cause, allow or permit emissions from the source of a hazardous air contaminant listed in Table 5 of s. NR 445.04 in such quantity or duration as to cause ambient air concentrations off the source's property that exceed the reference concentration shown in Table 5 of s. NR 445.04 on an annual basis.

3.

A source capable of emitting a HAP in an amount greater than the table value must submit a demonstration they will not exceed the applicable off property concentration for that HAP.

NR 445.04(6) COMPLIANCE REQUIREMENTS. (a) Compliance timing. Except as provided for in pars. (d), (e) and (f), any source which commences construction or modification after October 1, 1988 shall meet the emission limitations in this section upon startup.

NR 445.05(6) COMPLIANCE REQUIREMENTS. Any source whose allowable emissions of any hazardous air contaminant in Table 1, 2, 3, 4 or 5 of s. NR 445.04 are equal to or greater than the emission rate listed in the table for the hazardous air contaminant for the respective stack height and any incinerator subject to sub. (5) shall achieve compliance with the emission limitations of this section according to the compliance schedules in this subsection.

4.

A source that cannot emit a HAP in an amount greater than the listed value is not subject to the compliance requirements in the chapter.

Figure 4

Chapter NR 407 Table 2
Levels Of Air Contaminants For Determining Need For Inclusion In Permit Applications

| Air Contaminant Name | Sources of Regulation (See Footnotes Below) | Chemical Abstract Service Number ⁷ | Inclusion Level (lbs/yr) |
|----------------------|--|--|--------------------------|
| Acetaldehyde | 2, 3 | 75-07-0 | 2,000 |
| Acetamide | 2 | 60-35-5 | 2,000.0 |
| Acetic acid | 3 | 64-19-7 | 1,825 |
| Acetic anhydride | 3 | 108-24-7 | 887 |
| Acetonitrile | 2, 3 | 75-05-8 | 2,000.0 |
| Acetophenone | 2 | 98-86-2 | 2,000.0 |

NR 407.03(2) GENERAL CATEGORY OF EXEMPT SOURCES. (intro.) In addition to the specific categories of exempt sources identified in sub. (1), no operation permit is required for a direct source if the source is not a part 70 source or an affected source and all of the following requirements are met:

(d) The maximum theoretical emissions from the source for any hazardous air contaminant listed in Table 1, 2, 3, 4 or 5 of s. NR 445.04 do not exceed the emission rate listed in the table for the hazardous air contaminant for the respective stack height.

5.

A sources not capable of emitting a HAP in an amount greater than the 445 table values, and which meets all other exemptions is not required to get an operation permit.

NR 407.04 PERMIT APPLICATION REQUIREMENTS. The owner or operator of an air contaminant source which is not exempt under s. 285.60(5), Stats., or s. NR 407.03 shall submit an operation permit application or renewal application, in accordance with s. NR 407.05, by the dates specified in this section:

NR 407.05 APPLICATIONS AND FORMS. (4) The application shall contain all of the information required for the issuance of an operation permit. Except as provided in subs. (5) and (8), it shall include the following elements:

(c) The following emissions-related information:

1. The maximum theoretical emissions of all air contaminants from all emissions units, operations and activities except for those exempted under subd. 9. or 10. Fugitive emissions from emissions units, operations and activities shall be included in the permit application in the same manner as stack emissions, regardless of whether the source category in question is included in the list of sources contained in the definition of major source.

10. For any emissions unit, operation or activity that is included in the application, the applicant does not need to include information on any air contaminant if the maximum theoretical emissions of the air contaminant are less than the level for that air contaminant listed in Table 2 or if the maximum theoretical emissions of any air contaminant listed in Table 2 from all emission units, operations or activities at a facility are less than 5 times the level specified in Table 2 for that air contaminant.

6.

Sources not exempt from permitting requirements must include HAP emission related information for all units, operations or activities unless combined MTE are less than 5 times the table value.

Figure 5**Chapter NR 438 Table 1**

| Air Contaminant Name | CAS Number ¹ | Reporting Level (lbs/yr) |
|---|-------------------------|-----------------------------|
| Acetaldehyde | 75-07-0 | 6,000 |
| Acetamide | 60-35-5 | 6,000 |
| Acetic acid | 64-19-7 | 6,000 |
| Acetic anhydride | 108-24-7 | 4,436 |
| Acetonitrile | 75-05-8 | 6,000 |
| Acetophenone | 98-86-2 | 6,000 |
| 2-Acetylaminofluorene | 53-96-3 | 6,000 |
| Acrolein | 107-02-8 | 91 |
| Acrylamide | 79-06-1 | 105 |
| Acrylic acid | 79-10-7 | 6,000 |
| Acrylonitrile | 107-13-1 | 12 |
| Adriamycin | 23214-92-8 | 12 |
| Aflatoxins | 1402-68-2 | 12 |
| Aldrin | 309-00-2 | 91 |
| Allyl alcohol | 107-18-6 | 1,829 |
| Allyl chloride | 107-05-1 | 1,093 |
| Aluminum alkyls | 7429-90-5 ² | 725 |
| Aluminum pyro powders | 7429-90-5 ² | 1,829 |
| Aluminum soluble salts | 7429-90-5 ² | 725 |
| 2-Aminoanthraquinone | 117-79-3 | 125 |
| 4-Aminobiphenyl | 92-67-1 | 12 |
| Amitrole | 61-82-5 | 73 |
| ³ Ammonia | 7664-41-7 | 6,000 |
| Aniline | 62-53-3 | 3,648 |
| Anisidine | 29191-52-4 | 125 |
| o-Anisidine and o-anisidine hydrochloride | 90-04-0 ² | 125 |

NR 438.03 REQUIRED EMISSION INVENTORY REPORTS. (1) REPORTABLE AIR CONTAMINANTS AND LEVELS. (a) Any person owning or operating a facility which emits an air contaminant in quantities above the reporting levels listed in Table 1, except indirect sources of air pollution, shall annually submit to the department an emission inventory report of annual, actual emissions or, for particulate matter, PM₁₀, sulfur dioxide, nitrogen oxides, carbon monoxide and volatile organic compounds, throughput information sufficient for the department to calculate its annual, actual emissions.

7.

A source emitting a HAP in an amount greater than the table value must submit an annual report of actual emissions.

Figure 6

NR 410.04 ANNUAL EMISSION FEE. (1) **FEE REQUIRED.** Except as provided under sub. (3), any person who owns or operates a facility for which an operation permit is required under s. 285.60, Stats., shall pay an annual emission fee to the department at the rate specified in s. 285.69(2), Stats.

(2) **AIR CONTAMINANTS SUBJECT TO FEE.** (a) Except as provided under par. (b), the annual emission fee shall be based on the annual actual emissions of the air contaminants listed in Table 1 of s. NR 438.03, as those annual actual emissions are recorded in the annual emission inventory prepared by the department under s. NR 438.03(5).

(b) The following emissions are exempt from the emission fees required under this section:

1. Emissions from any acid rain phase I affected unit for the years 1995 through 1999.

2. Except as provided under sub. (4), emissions in excess of 4,000 tons per year of any air contaminant from any one facility.

3. Emissions of carbon monoxide and carbon dioxide.

4. Emission reduction credits reported as actual emissions.

(c) For the purpose of charging fees, the following groups of air contaminants shall be considered single air contaminants:

1. Particulate matter and PM₁₀.

2. Reduced sulfur compounds, mercaptans, hydrogen sulfide and total reduced sulfur.

3. **Air contaminants reported as both a hazardous air contaminant and as either a particulate or volatile organic compound.** The air contaminants which are not eligible for this exemption are identified by footnote number 3 in Table 1 of s. NR 438.03.

(3) **FACILITIES EXEMPT FROM ANNUAL EMISSIONS FEES.** The following facilities are exempt from the requirement to pay annual emissions fees under s. 285.69(2), Stats., and this section:

(a) **Any facility whose total annual actual emissions of all air contaminants listed in Table 1 of s. NR 438.03, and annotated with footnote 3, are less than 5 tons.**

(b) Indirect sources of air pollution.

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8.

A source required to have an operation permit emitting a HAP in an amount greater than the table value, and having actual billable emissions above five tons per year, must submit an annual report and pay annual fees.

Any pollutant that can be classified as a hazardous air pollutant and either a volatile organic compound or particulate matter is only billed as part of the volatile organic compound or particulate matter total.

Figure 7
NR 445 Table 1
Hazardous Air Contaminants With
Acceptable Ambient Concentrations

| Contaminant | CAS Number | Emission Rate in Pounds/Hour* w/emission points | |
|-------------------|------------|---|-------------|
| | | < 25 ft. | ≥ 25 ft. |
| Acetic acid | 64-19-7 | 2.083200 | 8.760000 |
| Hydrogen chloride | 7647-01-0 | 0.355200(c) | 1.368000(c) |
| Hydrogen fluoride | 7664-39-3 | 0.127200(c) | 0.489000(c) |
| Nitric acid | 7697-37-2 | 0.417600 | 1.752000 |
| Phosphoric acid | 7664-38-2 | 0.084000 | 0.336000 |

NR 445 Table 3

| Contaminant | CAS Number | lbs/year ² |
|---|------------|-----------------------|
| GROUP A CONTAMINANTS | | |
| 4-Aminobiphenyl | 92-67-1 | 25.0 |
| Arsenic and inorganic compounds, as As | 7440-38-2 | 25.0 |
| Asbestos | 1332-21-4 | 25.0 |
| Benzene | 71-43-2 | 300.0 |
| Benzidine | 92-87-5 | 2.0 |
| Pharmaceuticals (a total of all listed compounds) | | 25.0 |
| Azathioprine | 446-86-6 | |
| N,N-Bis(2-chloroethyl)-2-naphthylamine (Chloronaphazine) | 494-03-1 | |
| 1,4-Butanediol dimethanesulphonate (Myleran) | 55-98-1 | |
| Chlorambucil | 305-03-3 | |

NR 438 threshold = lesser of 50% of NR 445 x 8760 hrs/yr.
Or
6000 lbs/yr

NR 438 threshold = 50% of NR 445 x 8760 hrs/yr
Or
6000 lbs/yr

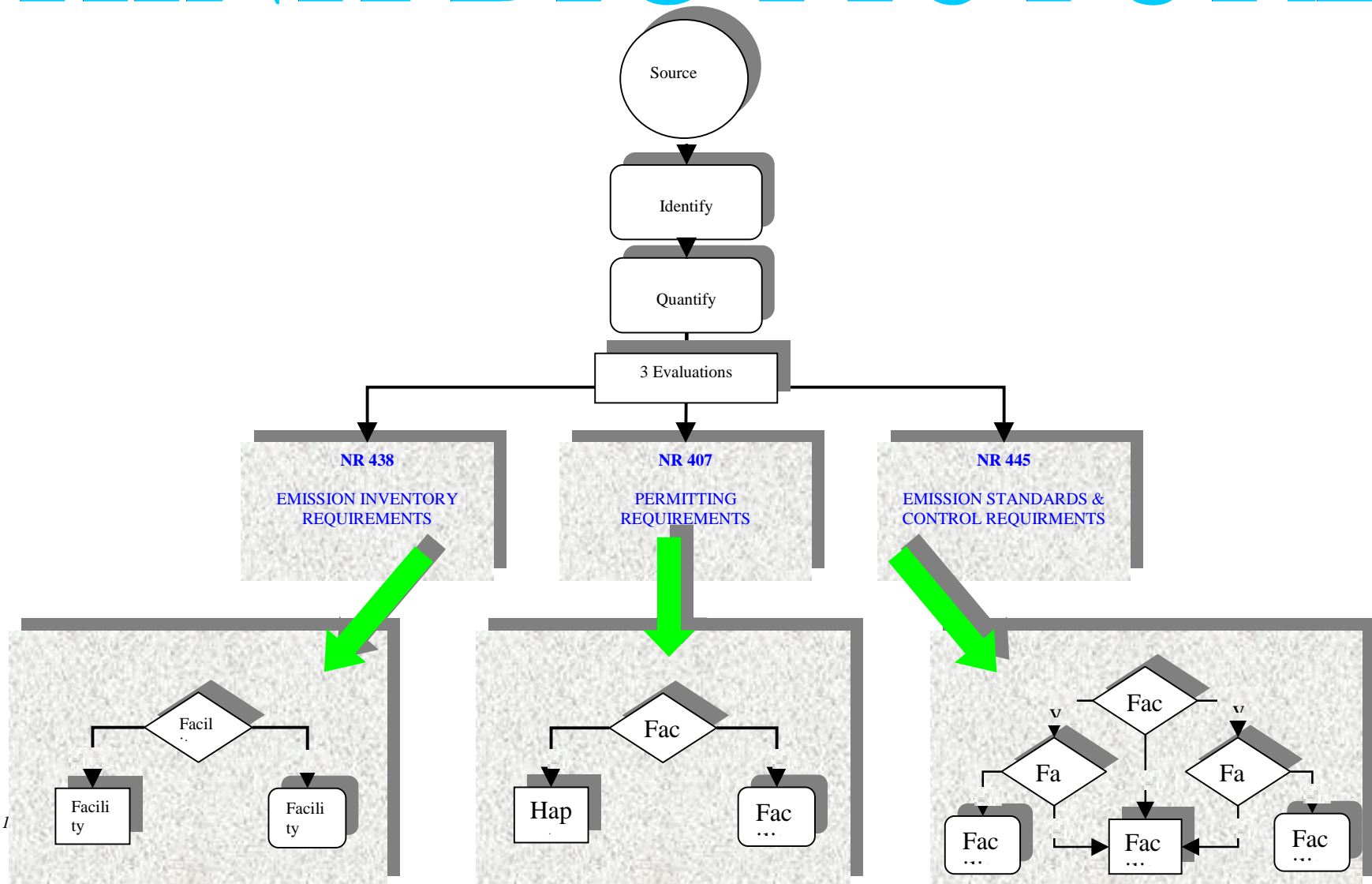
Chapter NR 438 Table 1

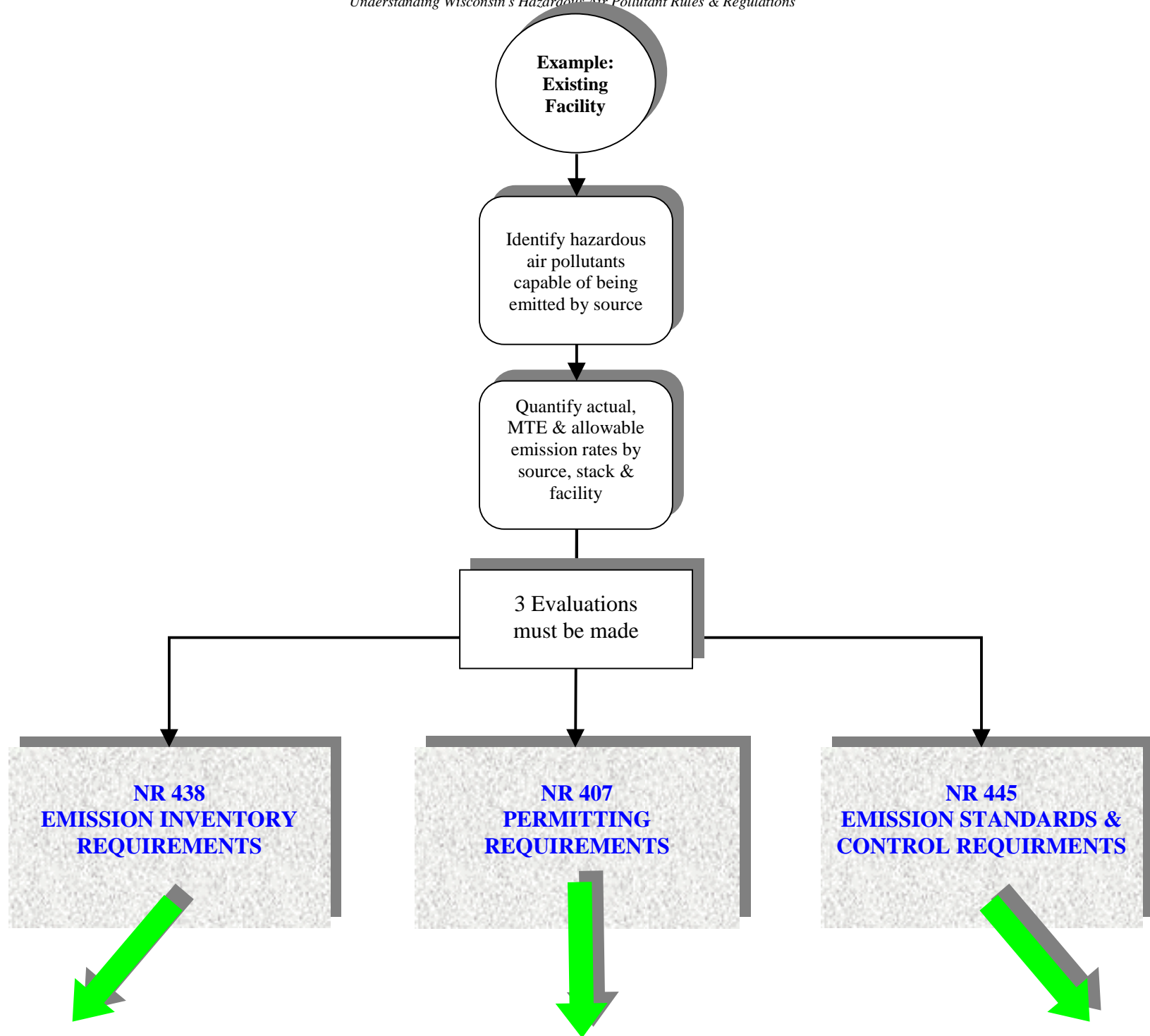
| Air Contaminant Name | CAS Number ¹ | Reporting Level (lbs/yr) |
|----------------------|-------------------------|--------------------------|
| Acetaldehyde | 75-07-0 | 6,000 |
| Acetic acid | 64-19-7 | 6,000 |
| Hydrogen fluoride | 7664-39-3 | 557 |
| Benzene | 71-43-2 | 150 |
| Azathioprine | 446-86-6 | 12 |

NR 438 threshold = 50% of NR 445 threshold

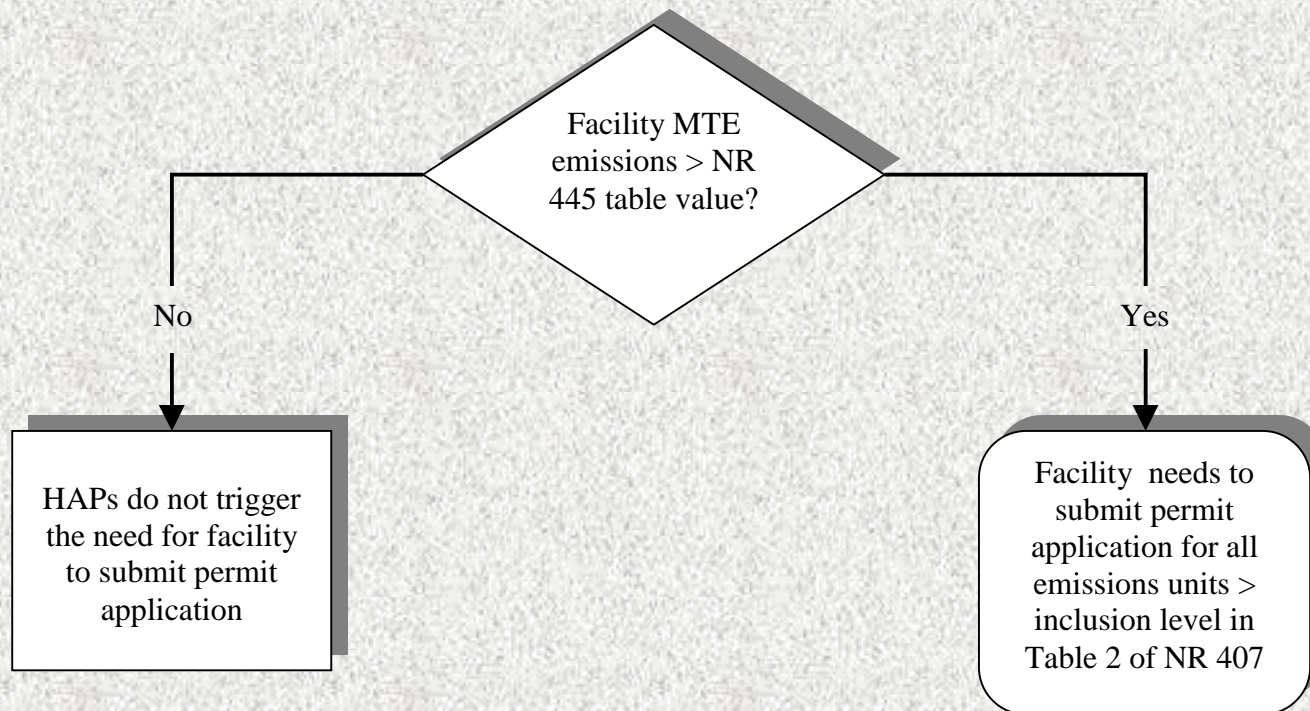
NR 438 threshold = 50% of NR 445 group threshold

THINK BIG PICTURE!



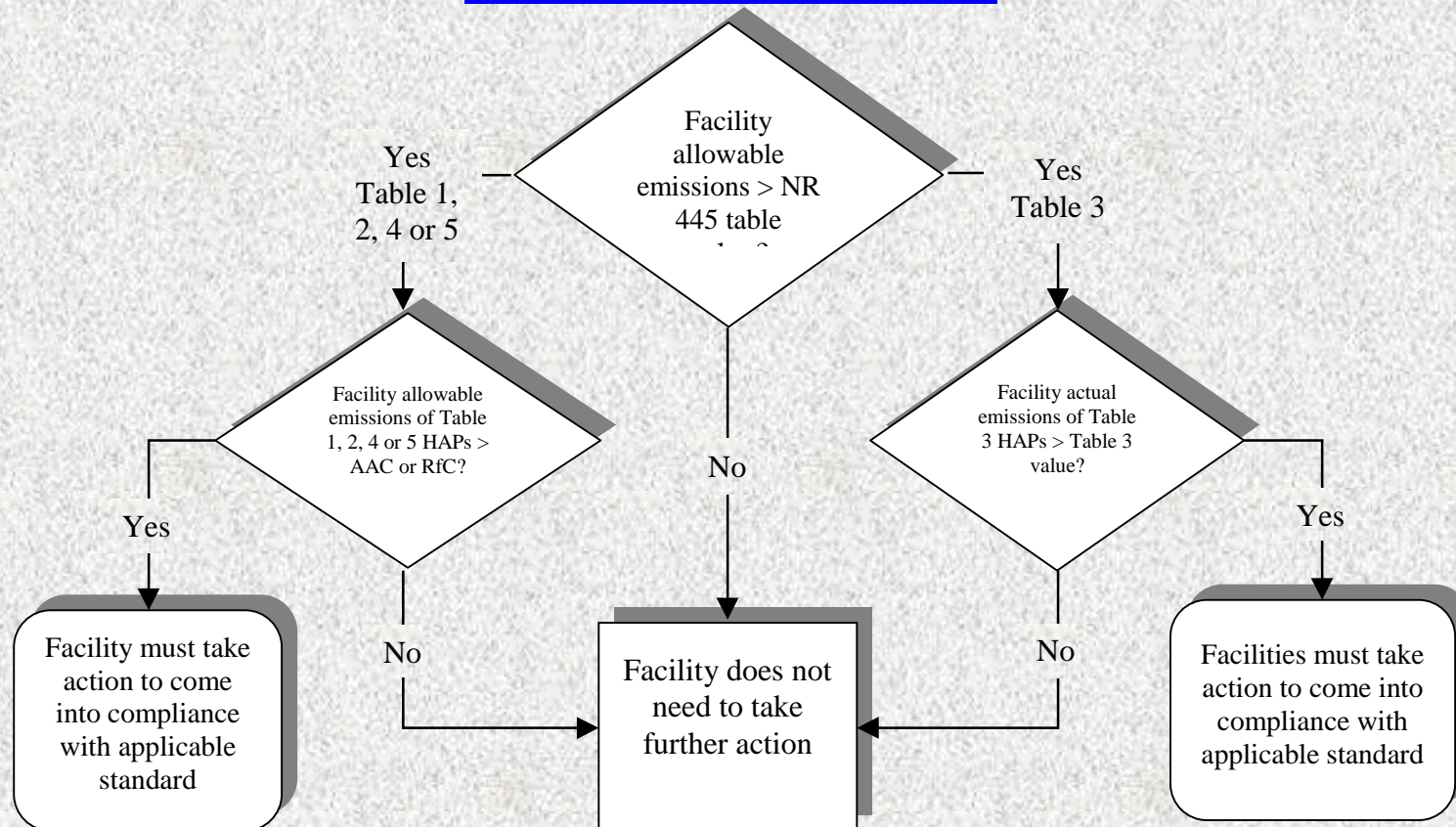


NR 407 PERMITTING REQUIREMENTS



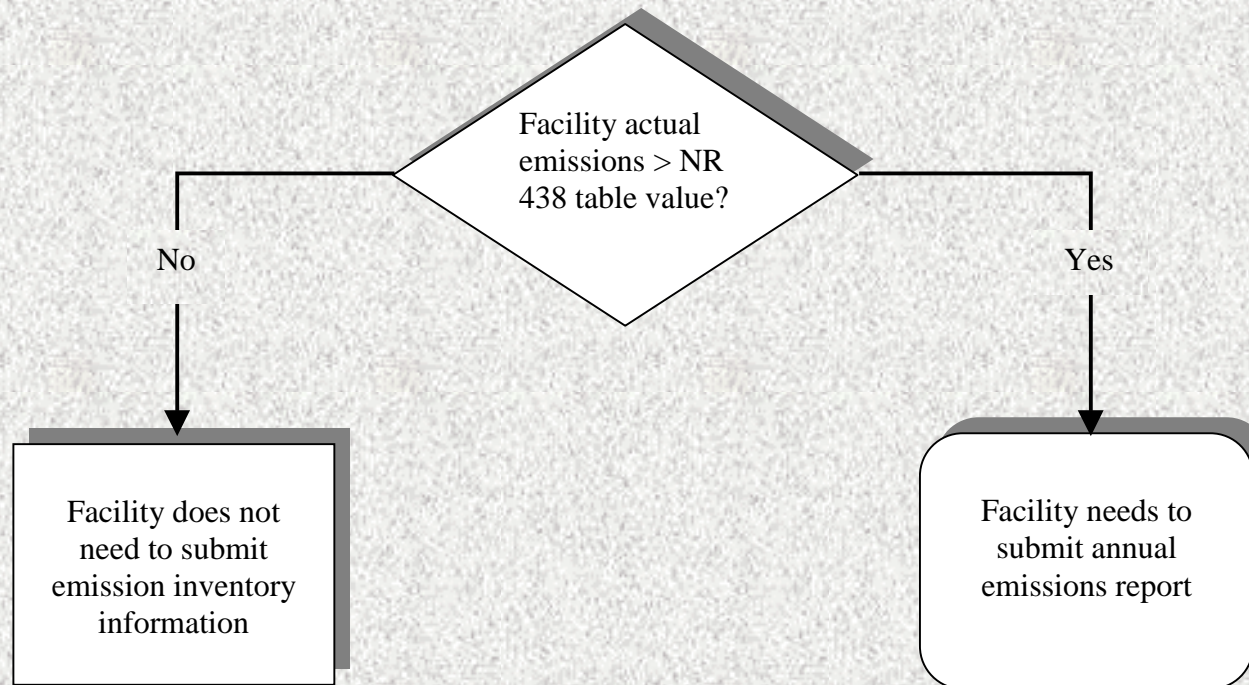
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NR 445 EMISSION STANDARDS



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NR 438 EMISSION INVENTORY REQUIREMENTS



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